1. A method for simultaneously regenerating a particulate filter coupled to an internal combustion engine and for desulfating a lean NOx trap disposed downstream of the particulate filter, comprising: producing regeneration in the particulate filter, such regeneration producing an exhaust gas exiting the particulate trap having an elevated temperature and reduced oxygen concentration relative to gases entering such particulate filter, such exiting gases producing desulfation in the lean NOx trap.

2. The method recited in claim 1 including adjusting at least one engine operating parameter to control both regeneration in the particulate filter and the desulfation of the lean NOx trap.

3. A method for simultaneously regenerating a particulate filter coupled to an internal combustion engine and for desulfating a lean NOx trap disposed downstream of the particulate filter, comprising:

adjusting at least one engine operating parameter to maintain a desired air fuel ratio for gases exiting the lean NOx trap in accordance with a difference between a reference set point air fuel ratio level and the air fuel ratio of gases exiting the lean NOx trap and wherein the reference set point level is changed between a rich air fuel ratio and a lean air fuel ratio as a function of the air fuel ratio of the exiting the lean NOx trap.

4. The method recited in claim 3 wherein the regeneration control comprises:

commencing a self-sustaining filter regeneration;

monitoring whether said regeneration causes temperature of said particulate filter to become greater than a predetermined value;

in response to said monitoring, adjusting one or more operating parameters so as to limit exothermic reaction via control of an excess oxygen amount entering said filter and prevent temperature from rising to become greater than a pre-selected value..

5. A method for simultaneously regenerating a particulate filter coupled to an internal combustion engine and for desulfating a lean NOx trap disposed downstream of the particulate filter, comprising:

controlling the oxygen concentration of the gas exiting the LNT by commanding an oxygen concentration setpoint for the gas entering the LNT, such commanded oxygen concentration being controlled by commanding an oxygen concentration setpoint for the gas entering the particulate filter.

6. A method for simultaneously regenerating a particulate filter coupled to an internal combustion engine and for desulfating a lean NOx trap disposed downstream of the particulate filter, comprising:

providing an oxygen sensor upstream of the particulate filter and using a signal produced by such sensor to control the particulate filter regeneration rate by metering the oxygen flow sensed by sensor and;

providing an oxygen sensor downstream of the particulate filter and using a signal produced by such sensor to control the oxygen content of the gas entering the lean NOx trap.

7. A method for simultaneously regenerating a particulate filter coupled to an internal combustion engine and for desulfating a lean NOx trap disposed downstream of the particulate filter, comprising:

adjusting the oxygen level into the particulate filter, comprising:

reducing the oxygen content of the gas entering the particulate filter if the oxygen concentration measured by downstream oxygen sensor is greater than a predetermined level, such latter oxygen content being measured by the upstream oxygen sensor;

increasing the oxygen content of the gas entering the particulate filter if the oxygen concentration measured by downstream oxygen sensor is less than the predetermined level, such latter oxygen content being measured by the upstream oxygen sensor.

8. The method recited in claim 7 including:

monitoring the temperature of the gas exiting the particulate filter and reducing the oxygen concentration into the particulate filter if such measured temperature becomes greater than a predetermined level.

9. The method from claim 7 including:

monitoring the temperature of the gas exiting the lean NOx trap and increasing the oxygen concentration into the particulate filter if such measured temperature becomes greater than a predetermined level.

10. A system , comprising:

a particulate filter coupled to an internal combustion engine;

a lean NOx trap disposed downstream of the particulate filter; and

a processor for producing regeneration in the particulate filter, such regeneration producing an exhaust gas exiting the particulate trap having an elevated temperature and reduced oxygen concentration relative to gases entering such particulate filter, such exiting gases producing desulfation in the lean NOx trap to simultaneously produce regeneration in the particulate filter and to produce for desulfating in the lean NOx trap, such regeneration producing an exhaust gas exiting the particulate trap having an elevated temperature and reduced oxygen concentration relative to gases entering such particulate filter, such exiting gases producing such desulfation in the lean NOx trap.

12. The system recited in claim 11 wherein the processor including adjusts at least one engine operating parameter to control both regeneration in the particulate filter and the desulfation of the lean NOx trap.

13. A system, comprising:

a particulate filter coupled to an internal combustion engine;

a lean NOx trap disposed downstream of the particulate filter; and

a processor for simultaneously producing regeneration in the particulate filter and producing desulfating in the lean NOx trap by adjusting at least one engine operating parameter to maintain a desired air fuel ratio for gases exiting the lean NOx trap in accordance with a difference between a reference set point air fuel ratio level and the air fuel ratio of gases exiting the lean NOx trap to simultaneously produce regeneration in the particulate filter and to produce for desulfating in the lean NOx trap, and wherein the

reference set point level is changed between a rich air fuel ratio and a lean air fuel ratio as a function of the air fuel ratio of the exiting the lean NOx trap.

14. The system recited in claim 13 wherein the regeneration control comprises:

commencing a self-sustaining filter regeneration;

monitoring whether said regeneration causes temperature of said particulate filter to become greater than a predetermined value;

in response to said monitoring, adjusting one or more operating parameters so as to limit exothermic reaction via control of an excess oxygen amount entering said filter and prevent temperature from rising to become greater than a pre-selected value..

15. A system, comprising:

a particulate filter coupled to an internal combustion engine;

a lean NOx trap disposed downstream of the particulate filter; and

a processor for producing signals to simultaneously regenerate the particulate filter and to desulfate the lean NOx by controlling the oxygen concentration of the gas exiting the lean NOx trap by commanding an oxygen concentration setpoint for the gas entering the lean NOx trap, such commanded oxygen concentration being controlled by commanding an oxygen concentration setpoint for the gas entering the particulate filter.

16. A system, comprising:

a particulate filter coupled to an internal combustion engine;

a lean NOx trap disposed downstream of the particulate filter; and

a processor for simultaneously regenerating the particulate filter and for desulfating the lean NOx trap, comprising:

providing an oxygen sensor upstream of the particulate filter and using a signal produced by such sensor to control the particulate filter regeneration rate by metering the oxygen flow sensed by sensor and;

providing an oxygen sensor downstream of the particulate filter and using a signal produced by such sensor to control the oxygen content of the gas entering the lean NOx trap.

17. A system, comprising:

a particulate filter coupled to an internal combustion engine;

a lean NOx trap disposed downstream of the particulate filter; and

a processor for simultaneously regenerating the particulate and for desulfating the lean NOx trap, comprising:

adjusting the oxygen level into the particulate filter, comprising:

reducing the oxygen content of the gas entering the particulate filter if the oxygen concentration measured by downstream oxygen sensor is greater than a predetermined level, such latter oxygen content being measured by the upstream oxygen sensor;

increasing the oxygen content of the gas entering the particulate filter if the oxygen concentration measured by downstream oxygen sensor is less than the predetermined level, such latter oxygen content being measured by the upstream oxygen sensor.

18. The system recited in claim 17 wherein the processor:

monitors the temperature of the gas exiting the particulate filter and reducing the oxygen concentration into the particulate filter if such measured temperature becomes greater than a predetermined level.

19. The system recited in claim 18 wherein the processor monitors the temperature of the gas exiting the lean NOx trap and increasing the oxygen concentration into the particulate filter if such measured temperature becomes greater than a predetermined level.

20. An article of manufacture comprising:

a computer storage medium having a program encoded for simultaneously regenerating a particulate filter coupled to an internal combustion engine and for desulfating a lean NOx trap disposed downstream of the particulate filter, such computer storage medium comprising:

code for adjusting at least one engine operating parameter to maintain a desired air fuel ratio for gases exiting the lean NOx trap in accordance with a difference between a

reference set point air fuel ratio level and the air fuel ratio of gases exiting the lean NOx trap and wherein the reference set point level is changed between a rich air fuel ratio and a lean air fuel ratio as a function of the air fuel ratio of the exiting the lean NOx trap.

21. The article of manufacture recited in claim 20 wherein the computer storage medium is a semiconductor chip.